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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/694,675	10/24/2000	Kenji Itoh	2576-105	3217

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EXAMINER	
SOBUTKA, PHILIP	

ART UNIT	PAPER NUMBER
2684	9

DATE MAILED: 01/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/694,675	Applicant(s) ITOH ET AL.	
	Examiner Philip J. Sobutka	Art Unit 2684	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *10-20* is/are allowed.

6)☒ Claim(s) *1,6,8 and 9* is/are rejected.

7)☒ Claim(s) *2-5 and 7* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 October 2000* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4*.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1,6,8,9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimozawa et al (A Monolithic Even Harmonic Quadrature Mixer Using a Balance Type 90 Degree Phase Shifter for Direct Conversion Receivers, Technical Report of IEICE 1998) in view of Stikvoort (US 6,236,847).

Consider claim 1. Shimozawa teaches a device comprising: an antenna for receiving an RF signal, a local oscillator, a first differential mixer for mixing the RF signal from the antenna with the local oscillator signal and producing a base band differential signal (i.e., the mixer produces two base band signals having a 180 degree phase

difference) (Shimozawa see especially figs 1-3), a first low pass filter note that since it filters a differential signal, it would be a differential filter (Shimozawa see especially figs 1-3), and base band circuitry for receiving the filtered base band signals (Shimozawa see especially figs 1-3). Shimozawa lacks a teaching of the filter being a passive filter. Stikvoort teaches a passive low pass filter that does not require active elements like op amps resulting in lower costs and often in more stable operation as well as allowing the filter to be easily realized in standard IC technologies, resulting in a lower cost solution ((Stikvoort, col 2, lines 30-45). It would have been obvious to one of ordinary skill in the art to modify Shimozawa to use a passive low pass filter as taught by Stikvoort in order to eliminate active elements resulting in lower costs and more stable operation as well as allowing the filter to be easily realized in standard IC technologies, resulting in lower cost.

As to claim 6, note that Shimozawa teaches a phase shifter for producing the first and second RF signals separated by 90 degrees and a second mixer and low pass filter signals (Shimozawa see especially figs 1-3). It would have been obvious to one of ordinary skill in the art to modify the second lpf for the reasons given above.

As to claims 8,9, note that Shimosawa's mixers are even harmonic mixers.

4. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bockelman et al (US 6,118,322) in view of Ranky (US 5,072,200).

Consider claim 1. Bockelman teaches a device comprising: an antenna for receiving an RF signal (Bockelman see especially fig 1, item 110), a local oscillator (Bockelman see especially fig 1, item 150), a first differential mixer for mixing the RF

signal from the antenna with the local oscillator signal and producing a base band differential signal (i.e., the mixer produces two base band signals having a 180 degree phase difference) (Bockelman see especially fig 1, item 135 col 2, lines 51 – 64), a first filter, note that since it filters a differential signal, it would be a differential filter (Bockelman see especially fig 1, item 145), and base band circuitry for receiving the filtered base band signals (Bockelman see especially fig 1, time 180). Bockelman lacks a teaching of the filter being a low pass filter. Stikvoort teaches a passive low pass filter that does not require active elements like op amps resulting in lower costs and often in more stable operation as well as allowing the filter to be easily realized in standard IC technologies, resulting in a lower cost solution ((Stikvoort, col 2, lines 30-45). It would have been obvious to one of ordinary skill in the art to modify Bockleman to use a passive low pass filter as taught by Stikvoort in order to eliminate active elements resulting in lower costs and more stable operation as well as allowing the filter to be easily realized in standard IC technologies, resulting in lower cost.

Allowable Subject Matter

5. Claims 2-5,7, are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. Claims 10-20 are allowed.

Consider claim 2. The nearest prior art as shown in Bockleman fails to teach the device of claim 1 further including: a first inductor for passing and transmitting the first base band signal sent form the first mixer to the base band circuit; a second inductor for

passing and transmitting the second base band signal sent from the first mixer to the base band circuit; and a capacitor coupled between the first and second inductors

Consider claim 3. The nearest prior art as shown in Bockleman fails to teach the device of claim 1 wherein the first low pass filter has a cut off frequency lower than a channel next to a channel neighboring the desired channel.

Consider claim 5. The nearest prior art as shown in Bockleman fails to teach the device of claim 1 wherein the base band circuit can operate with only a positive power supply.

Consider claim 7. The nearest prior art as shown in Shimozawa and Stikvoort fails to teach the device of claim 6, wherein the first and second low pass filters are formed of a single element.

Consider claim 10. The nearest prior art as shown in Shimozawa and Stikvoort and Bockleman fail to teach a device comprising an antenna for receiving a radio frequency signal including a plurality of channels; a local oscillator; a first differential mixer for mixing the RF with the LO signal to produce first and second differential base band signals, a first low pass filter of the differential type and a passive type for receiving the first and second base band signals from the first mixer; a second low pass filter of the passive type for receiving the first and second base band signal passed through the first low pass filter and having a cut off frequency higher than a cut off frequency of the first low pass filter; and a base band circuit for receiving the first and second base band signals passed through the second low pass filter.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Bartusiak (US 6,016,422) teaches a direct to base band receiver suing differential mixers.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Philip J. Sobutka whose telephone number is 703-305-4825. The examiner can normally be reached on Monday-Friday 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nay Maung can be reached on 703-308-7745. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4700.

Philip Sobutka

Pjs
December 14, 2003

NAY MAUNG
SUPERVISORY PATENT EXAMINER